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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,949	07/16/2007	Maja Hackenberger	12406-220US1 P2004,0327 U	7071

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EXAMINER	
EVERHART, CARIDAD	

ART UNIT	PAPER NUMBER
2891	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,949	HACKENBERGER ET AL.	
	Examiner	Art Unit	
	Caridad M. Everhart	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10-13-06;11-19-07*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 11, 14 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Sikora (US 5,420,078).

Sikora discloses forming layer 24 on substrate 22(Fig. 3a), forming a structures mask 26, isotropically etching the layer 23, and anisotropically etching the layer, which Fig. 3c shows is etched partially under the mask. Multiple openings are shown in Fig. 3c. The structure which is formed is a multilayer structure(col. 3,lines 53-64). The first etch is isotropic and the second is anisotropic(col. 4, lines 8-12 and 53-64). Fig. 3d shows that the mask has been removed. The isotropic etch results in tapered etching, which is very well known in the art. Because of the comprising language of the claims, the limitation that the isotropic etch transfers the first feature and the anisotropic etch transfers the second feature is satisfied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sikora as applied to claim 1 above, and further in view of Lee et al (US 5,431,770).

Sikora is silent with respect to the first etch on the first layer and the second etch on the second layer.

Lee et al discloses a hardmask layer which is isotropically etched under a photoresist pattern(col. 2, lines 3-5 and 13-22). The conductive layer under this layer is anisotropically etched (col. 2, lines 27-35). The stack is a stack of conductive layers with a photoresist mask which is patterned(Fig. 1). The first conductive layer may be

polysilicon, and the second may be refractory metal(col. 1, lines 5—63). The hardmask may be a material such as TEOS(col. 1, lines 65-67). The layer 20 is photoresist. A plurality of features such as transistors may be formed(col. 1, l ines 21-24). It is implied that the etchants are selective for the layer upon which the elchant acts.

It would have been obvious to one of ordinary skill in tlhe art at the time of the invention to have combined the method taught by Sikora with the method taught by Lee et al in order to obtain the benefit of the use of one mask.

Claims 3 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sikora in view of Lee et al as applied to claim 2 above and further in view of Whitehurst et al (US 6,468,439).

Sikora in view of Lee et al is silent with respect to the relative sizes of the structures.

Whitehurst et al disclose etching metal stacks using a mask(col. 1,lines 22-30). Fig. 1 and fig. 2 show different widths of the lines(col. 5, lines 40-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed openings of rough and fine structure in the mask taught by Sikora in order to form the features of different widths as taught by Whitehurst et al in order to obtain the benefit of using one mask as taught by Sikora. It would have been obvious to one of ordinary skill in the art at the time of the invention to have chosen the recited relative widths because the width is a variable of the art which one of ordinary skill in the art would have been able to determine.

Claims 5, 6, 8-10 ,21-13 , 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sikora in view of Lee et al as applied to claim 2 above, and further in view of Kishita et al (US 4,650,543).

Sikora is silent with respect to the first and the second layers and with respect to the recited devices.

Kishita et a disclose formation of FET devices and I show in Fig. 1 a WN layer on a substrate, an Au layer on the WN layer, and a Ti layer on the Au layer. Fig. 2 shows a Ti layer on a substrate, a Pt layer on the Ti layer, and an Au layer on the Pt layer. The layers form wiring and bond pads(col. 1, lines 15-20). Because Kishita et al disclose FET, the substrate would be expected to be doped, which satisfies the limitation of active layers.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the method taught by Sikora with the materials taught by Kishita et al in order to obtain the benefit of using one masking layer in order to form the wiring and bond pads taught by Kishita et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to have applied the method taught by Sikora to the formation of the devices such as LED and grating pattern for the same reasons. An LED would be expected to require bond pads and closely spaces lines, and the grating pattern would require closely spaced lines, to which the pattern forming method taught by Sikora could be applied.

The prior art of record not relied upon is considered relevant to applicant's disclosure. Choi et al (US 7,358,195).

Fig. 2B shows tapered etched metal stack. Col. 2, lines 38-53 disclose that the layer 21 is aluminum and the other layer is Mo. The layers are wet etched and then dry etched to form the desired taper(col. 2,lines 52-63).

Akram et al (US 5,894,161).

Akram et al discloses a semiconductor wafer with pads and lines shown in Fig. 3B2 and 3C2(col. 1, lines 42-47). There may be a piezoelectric layer on the substrate(col. 2,lines 9-21).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caridad Everhart/
Primary Examiner
AU 2895

7-15-2008